Navigating the Complexity of Generative AI Adoption in Software Engineering

Year: 2023 | *Citations: 142* | *Authors: Daniel Russo*

Abstract

This article explores the adoption of Generative Artificial Intelligence (AI) tools within the domain of software engineering, focusing on the influencing factors at the individual, technological, and social levels. We applied a convergent mixed-methods approach to offer a comprehensive understanding of AI adoption dynamics. We initially conducted a questionnaire survey with 100 software engineers, drawing upon the Technology Acceptance Model, the Diffusion of Innovation Theory, and the Social Cognitive Theory as guiding theoretical frameworks. Employing the Gioia methodology, we derived a theoretical model of AI adoption in software engineering: the Human-AI Collaboration and Adaptation Framework. This model was then validated using Partial Least Squares–Structural Equation Modeling based on data from 183 software engineers. Findings indicate that at this early stage of AI integration, the compatibility of AI tools within existing development workflows predominantly drives their adoption, challenging conventional technology acceptance theories. The impact of perceived usefulness, social factors, and personal innovativeness seems less pronounced than expected. The study provides crucial insights for future AI tool design and offers a framework for developing effective organizational implementation strategies.